It's About Time! Improve Confidence in Food Analysis with Retention Time Locking and New Pesticide Screening Library

While pesticides improve crop yields and help alleviate food shortages, many of the chemicals used have deleterious effects on health. To ensure safe foods, in excess of 700 pesticides are regulated worldwide and the sheer number of compounds puts strain on most laboratories. To address the issue, many laboratories qualify samples using a gas chromatograph (GC) and a pesticide-screening program identifying each pesticide by its retention time. Typical pesticide screening programs search for 100 or fewer compounds. Following screening, samples containing pesticides that exceed regulated levels are further analyzed for confirmation on a GC equipped with a mass selective detector (MSD). Unfortunately, retention times may vary from GC to GC and especially from GC to GC/MS even when using the same method. Consequently, pesticide identification can be difficult and time-consuming.

Agilent's exclusive Retention Time Locking (RTL) software used in conjunction with a retention time locked 567 compound pesticide library greatly simplifies compound identification. Combining Agilent's 6890N GC system, equipped with either sensitive element-specific detectors or the 5973 inert MSD, with the retention time locked pesticide library and ChemStation software make screening and confirmation faster and easier.

What Is Retention Time Locking (RTL)?

RTL provides analysts with the ability to precisely match retention times in any Agilent GC system to those in another Agilent GC system with the same nominal method and column.

RTL calibrates column head pressure and retention time for a target compound. Once done, the method is "locked" and any future deviation in retention time due to column changes can be compensated for by re-adjusting pressure using an internal calibration - a process known as re-locking. This is demonstrated by removing one metre from a column and performing pressure adjustments (re-locks) to get back to the original target retention time (Figure 1). This method is useful for analysts who already perform frequent column cuts to remove non-volatile contamination.

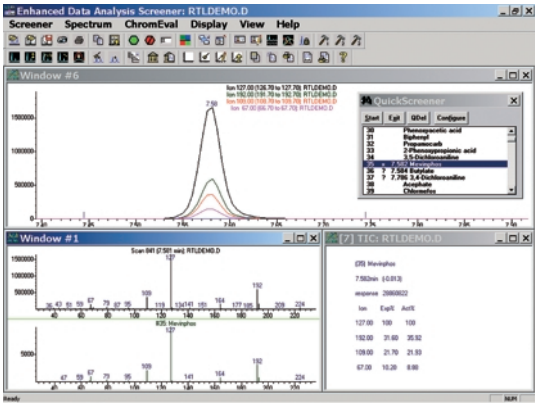

Figure 2. GC/MS ChemStation software after screening a sample

Figure 2 shows a screen capture of the GC/MS ChemStation software after screening a pesticide sample. Points to note are:

1. The peak's retention time and extracted ions correlate very closely with those expected for Mevinphos.
2. Comparing the sample spectrum to that for Mevinphos in the library confirms the result.

Once the software has "screened" the sample and the results verified, a Screener Report can be generated.

Features of the Pesticide Library

- **Locked retention times**
  - 567 pesticides and suspected endocrine disrupters
- **Retention time repeatability**
  - Run to run; operator to operator; instrument to instrument
  - Search RT in Agilent's pesticide library
- **Minimal method development**
  - GC and GC/MS conditions are included with the library
- **GC and GC/MS applicability**
  - Available for GC ChemStation
  - Available for GC/MS ChemStation
- **Other RTL libraries available**
  - Find out more at the Agilent Technologies website: www.agilent.com/chem/gc

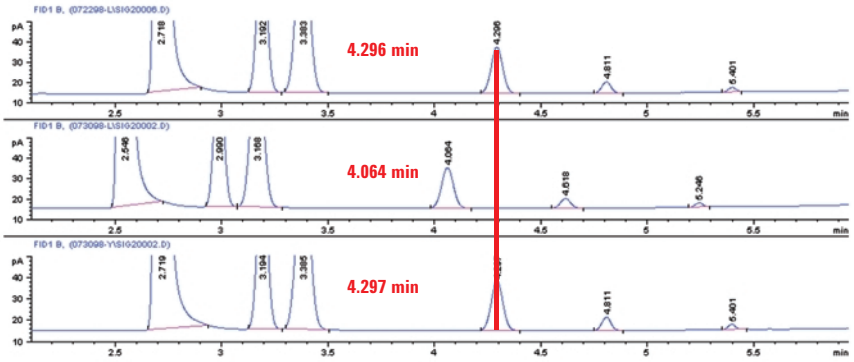

Figure 1. Effect of shortening the column and relocking

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